AMENDED CLAIMS

(as filed before the IPEA on October 13, 2004)

1.   A method of creating a three-dimensional model of a
tangible existing object, the method comprising the
steps:

digitizing the object to create a mesh model of the
object;

breaking the mesh model into bilinear surface
elements; and

uniting the bilinear surface elements to a surface
model or solid model of the object.

2.   A method according to claim 1, wherein the mesh
model is polygon mesh.

3.   A method according to claim 1 or 2, wherein the mesh
model is obtained from point cloud data of the object.

4.   A method according to claim 1, wherein the bilinear
surface elements are triangular.

5.   A method according to claim 1 or 4, wherein the
bilinear surface elements are NURBS patches.

6.   A method according to claim 1, further comprising
the step generating a finite element model from the
surface model or solid model.

7.   An apparatus for creating a three-dimensional model
of a tangible existing object, the apparatus comprising:

a digitizer for creating a mesh model of the object;
and

a data processor for executing the following data
processing steps: reading the mesh model; breaking the

mesh model into bilinear surface elements; and uniting
the bilinear surface elements to a surface model or solid
model of the object.

5   8.   An apparatus according to claim 7, wherein the
digitizer creates a polygon mesh as the mesh model.

9.   An apparatus according to claim 7, wherein the data
processor generates a finite element model of the object
10   from the surface model or solid model.

10.   An apparatus according to any of claims 7 to 9,
wherein the data processing steps are executed in the
data processor by software routines.
15

11.   A software product for creating a three-dimensional
model of a tangible existing object, the software product
executing the following data processing steps by software
routines when it runs on a computer: reading a mesh model
20   of the object; breaking the mesh model into bilinear
surface elements; and uniting the bilinear surface
elements to a surface model or solid model of the object.

12.   A software product according to claim 11, which
25   reads a polygon mesh as the mesh model.

13.   A software product according to claim 11 or 12,
which creates the bilinear surface elements by breaking
the mesh model of the object into bilinear NURBS patches
30   through conversion into IGES format.

14.   A software product according to claim 13, wherein
the mesh model converted into the IGES format comprises
exclusively surface elements of IGES entity #128.

35

15. A software product according to claim 11, which generates a finite element model of the object from the surface model or solid model through CAD-FEM coupling.